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Clayton GROUP SERVICES

TECHNICAL MEMORANDUM

To: Steve Faryan, Kevin Turner

From: Jeff Pope

CC: Chris Cahnovsky, Gina Search, Jim Moore, Paula Stine, Tom Binz, Hartford Working Group

Subject: **Expansion of Vapor Control System to the Hartford Community Center - Village of Hartford, Illinois**

Date: March 1, 2005

Introduction

Results from the recent SVE pilot test conducted at the Hartford Community Center indicate that the North Olive stratum can be influenced through the use of vapor extraction. The SVE pilot test results will be submitted in a technical memorandum by March 31, 2005. The Hartford Working Group proposes to expand the Vapor Control System (VCS) with the installation of additional shallow and deep vapor extraction wells in the Northwestern portion of the Village of Hartford.

Design Details

The upgraded VCS is currently capable of extracting a total of 2,250 scfm. Based on a total estimate of 100 scfm from each existing deep well, 50 scfm from the Watkins Street sewer backfill (only one of these four sewer backfill wells provides adequate vacuum influence), and 50 scfm from both the Maple Street and Hawthorne Street sewers, the total required flow capacity is 1,650 scfm (see Table 1).

Figure 1 illustrates the proposed location for both shallow and deep vapor extraction wells. A total of 3 well nests (both shallow and deep) wells will be installed on the Hartford Community Center property. One shallow well (screened in the North Olive) was installed during the SVE pilot test (HSVE-20S). The sewer on Arbor Street will also be connected to the system in a similar manner to that of Maple and Hawthorne Streets (see Figure 2).

Two additional vapor extraction well nests (both shallow and deep) will be installed along Birch Street as shown on Figure 2. These locations were chosen based on the expected radius of influence determined by the SVE pilot tests (i.e., a minimum of 150 ft

radius of influence). Assuming a total maximum flow rate from each deep well as 100 scfm and a flow rate of 50 scfm from the Arbor Street sewer, a total of 550 scfm (for a total of 2,000 scfm) of additional flow will be required to operate these additional wells. Therefore, the three new units being installed (i.e., 2,250 scfm) will provide adequate capacity to bring this expansion section online.

Individual 4-inch ID HDPE piping will connect each extraction well (shallow and deep) to a main 10-inch diameter header that will begin at the eastern corner of W. Birch and North Delmar. From this vault, the main header will continue south on Delmar to E. Date. The header will continue on Date for eventual tie-in to the existing belowground header piping connecting the Date Street vault just north of Date and Market Streets to the main system. An additional vault will be installed at that location.

The deep wells will be constructed of 4-inch ID PVC with 0.020-inch slot screens. The screened interval will be between 7 and 27 feet below ground surface, similar to the new VCS wells. Shallow wells will be installed at each location (with exception of HSVE-20 where the shallow well already exists) in a similar manner to those installed as part of the ongoing upgrade to the VCS.

Figure 3 illustrates the installation details for these shallow wells. The wells will be screened in the North Olive Stratum at each location. Based on the geologic information regarding the North Olive Stratum, the new shallow HSVE wells will be screened from approximately 7 to 12 feet below ground surface. Tie-ins will be accomplished by installing a tee to the existing connection between the deep HSVE and the VCS piping (see Figure 3). Each new shallow well will be fitted with a control valve and vacuum gauge within a flush-mounted, concrete vault.

To provide the required vacuum/pressure monitoring of both the North Olive and Main Sand in Northwest Hartford, additional vacuum monitoring points (MPs) will be installed. The final design details will include the number and proposed location for these additional MPs.

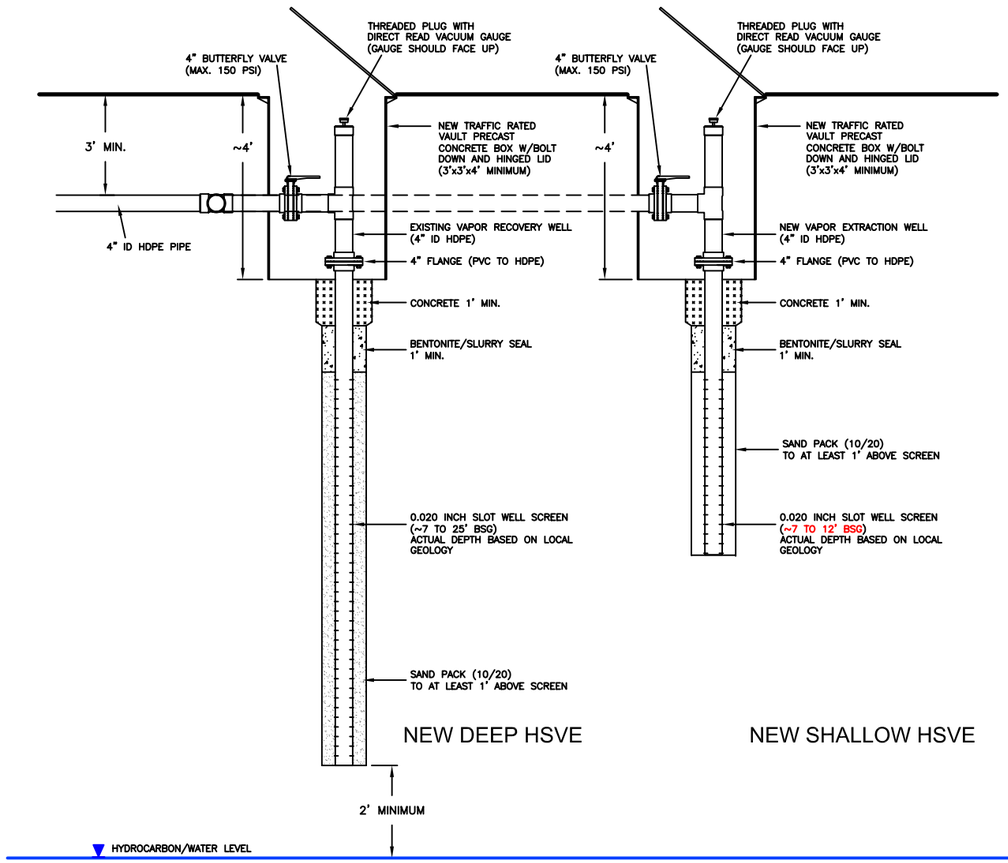
Operational Strategy

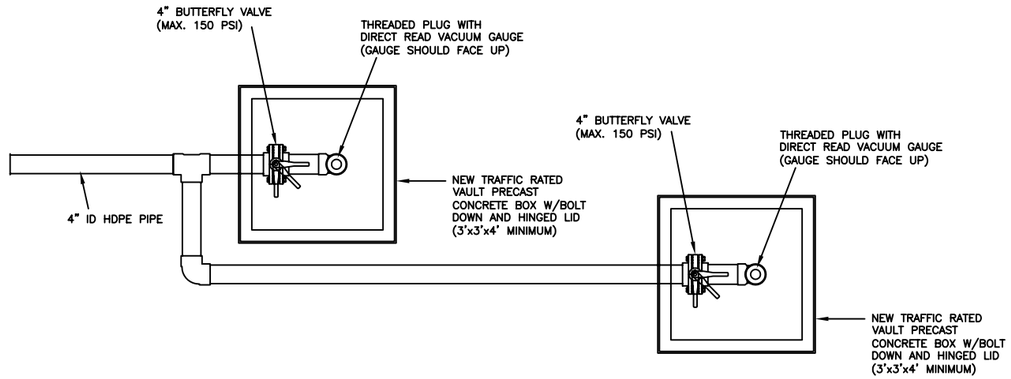
Once the new shallow and deep wells are connected to the system, these wells will be brought online to begin extracting from the Northwestern portion of North Hartford. Due to the design airflow capacity of the new system (i.e., 2,250 cubic feet per minute) the flow from the deeper wells will likely need to be reduced to provide the required airflow from the North Olive stratum.

As part of the continuing startup and pilot testing of the upgraded VCS, vacuum and pressure data from the North Olive and Main Sand will be evaluated to determine the optimal balance for shallow and deep vapor extraction.

Implementation Schedule

It is anticipated that installation of the additional vapor extraction wells and connection to the existing VCS can be accomplished within 3 to 6 months of this submission, pending no unforeseen complications of the start-up of the VCS and following approval by the USEPA.





TYPICAL NEW SHALLOW
VAPOR EXTRACTION WELL CONNECTION

NO.	DATE	BY	REVISIONS

ENGINEERS' SEAL

DESIGN BY: JLP
CHECKED BY: JLP
DRAWN BY: BCP
DATE: 2-20-05
SCALE: AS SHOWN
CAD NO.: FIG 3
PROJECT NO.: 15-03095.13

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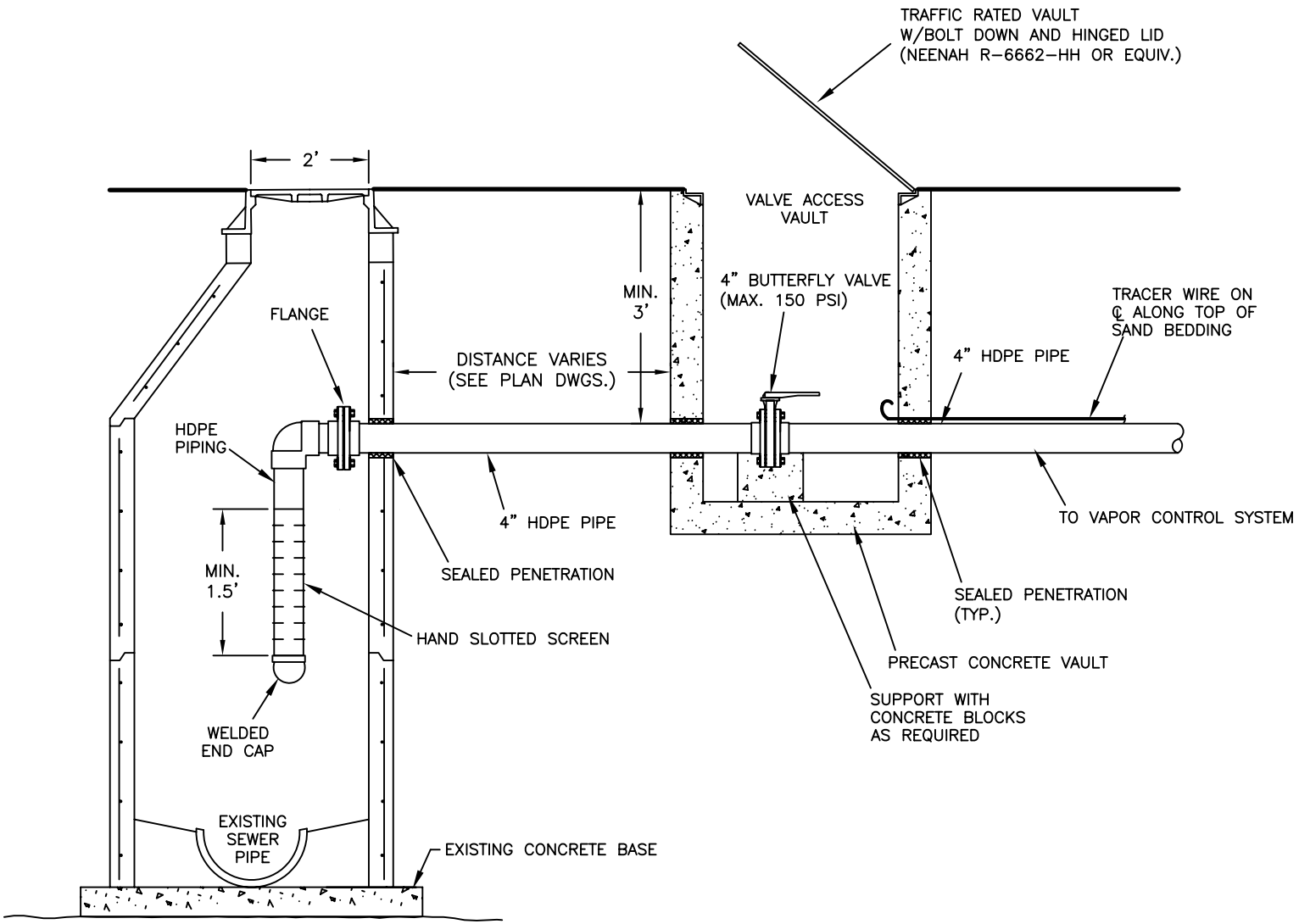
SHALLOW VAPOR EXTRACTION WELL CONSTRUCTION DETAILS

THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

FIGURE
3



CHK BY	JLP
DWN BY	BCP
DATE	2-20-05
SCALE	NONE
CAD NO.	FIG 2 HCC
PRJ NO.	15-03095.13

PROPOSED VCS EXPANSION
SEWER VAPOR EXTRACTION SCREEN DETAIL

THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

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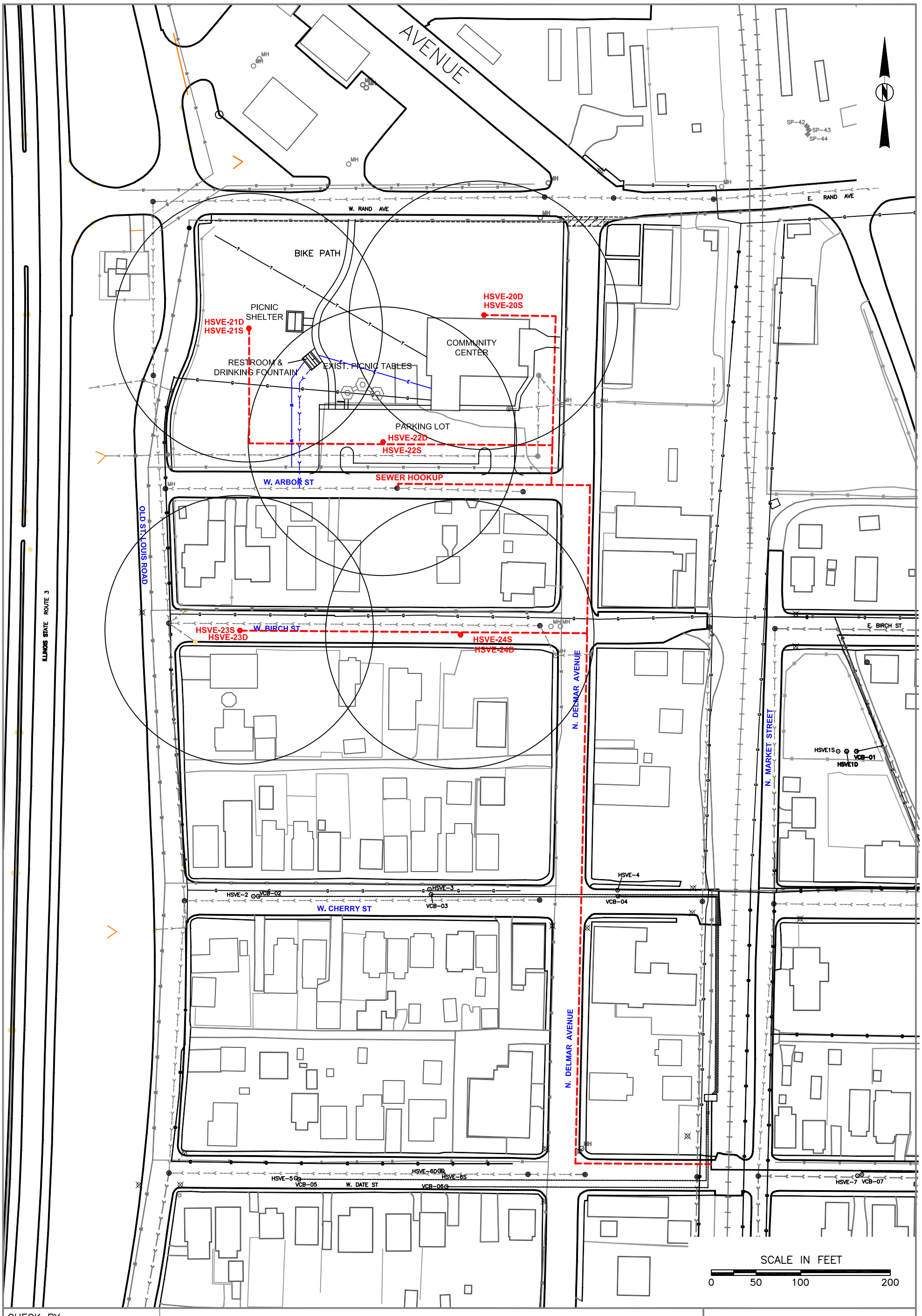
FIGURE
2



CHECK BY	
DRAWN BY	BCP
DATE	2-18-05
SCALE	AS SHOWN
CAD NO.	HCC Expansion
PRJ NO.	15-03095.13

PROPOSED SVE SYSTEM EXPANSION
HARTFORD COMMUNITY CENTER

THE HARTFORD AREA HYDROCARBON PLUME SITE
THE HARTFORD WORKING GROUP
HARTFORD, ILLINOIS

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FIGURE 1

TABLE 1

Flow Summary - VCS Expansion to HCC
Hartford, Illinois

Well Location - Deep Wells	Existing Wells	Max Flow (scfm)
HSVE-1 (Main Sand)	Yes	100
HSVE-2 (Main Sand)	Yes	100
HSVE-3 (Main Sand)	Yes	100
HSVE-4 (Main Sand)	Yes	100
HSVE-5 (Main Sand)	Yes	100
HSVE-6 (Main Sand)	Yes	100
HSVE-7 (Main Sand)	Yes	100
HSVE-8 (Main Sand)	Yes	100
HSVE-9 (Main Sand)	Yes	100
HSVE-10 (Main Sand)	Yes	100
HSVE-11 (Main Sand)	Yes	100
HSVE-12 (Main Sand)	Yes	100
HSVE-13 (Watkins Sewer)	Yes	0
HSVE-14 (Watkins Sewer)	Yes	0
HSVE-15 (Watkins Sewer)	Yes	0
HSVE-16 (Watkins Sewer)	Yes	50
HSVE-17 (Main Sand)	Yes	100
HSVE-18 (Main Sand)	Yes	100
HSVE-19 (Main Sand)	Yes	100
Maple St. Sewer	Yes	50
Hawthorne St. Sewer	Yes	50
Subtotal		**1,650**
HSVE-20 (Main Sand)	No	100
HSVE-21 (Main Sand)	No	100
HSVE-22 (Main Sand)	No	100
HSVE-23 (Main Sand)	No	100
HSVE-24 (Main Sand)	No	100
Arbor St. Sewer	No	50
Subtotal		**550**
TOTAL		**2,200**